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CHICK HATCHERY SURVEY

1937-38

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CONTENTS

	Page
Introduction.....	1
Summary.....	1
Development of hatchery industry.....	2
Geographic distribution of hatchery industry.....	4
Distribution.....	4
Capacities.....	6
Capacity classification.....	7
Estimated chick production.....	8
Extent of increase.....	10
Prices paid.....	10
Profit factors.....	11
Rate of hatch.....	13
Capacity classification.....	14
Hatchery operating months.....	14
Operating variations.....	15
Number and size of hatchery flocks.....	16
Custom hatching.....	20
Hatcheries selling sex-separated chicks.....	21
Destroying cockerel chicks.....	22
Started chicks.....	23
Interstate aspect of the hatchery survey.....	25
Extent of interstate shipments.....	25
Hatcherymen as dealers.....	27
Hatcheries keeping cost records.....	27

LIST OF FIGURES

FIGURE 1. Development of hatchery industry, number of hatcheries reported as operating in each year.....	3
2. Percentage of hatcheries operating each month, 1937-38.....	15
3. Percentage of hatcheries doing custom hatching, 1937-38.....	20
4. Percentage of hatcheries selling sex-separated chicks, 1937-38.....	22
5. Percentage of hatcheries destroying cockerel chicks, 1937-38.....	23
6. Percentage of hatcheries selling started chicks, 1937-38.....	24
7. Percentage of hatcheries selling chicks interstate, 1937-38.....	26

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CHICK HATCHERY SURVEY, 1937-38

INTRODUCTION

During recent years the baby chick hatchery industry has been experiencing many significant changes, not only in the methods and efficiency of production but also in the types and areas of production. In addition the hatchery industry has expanded so rapidly that a survey made of this industry in 1934¹ has become out of date.

Since the hatchery industry is a very fundamental and vital part of the whole poultry industry, the changes which take place have a marked bearing on subsequent developments in the poultry industry. The results of a second survey contained in this publication indicate and measure the more recent significant changes that have occurred.²

The data published herein covers the hatchery year August 1, 1937, through July 31, 1938. This period was chosen in order to begin the survey during the month in which the fewest hatcheries were in operation. The 1934 data, used to show the growth that has occurred since that time, are for the calendar year so that the two sets of data are not strictly comparable. However, both covered a 12-month operating period and the changes occurring between the two periods are validly significant. Other differences in the two surveys which may affect the validity of comparisons will be mentioned later.

An effort was made to include in this survey every commercially operated hatchery in the United States. While all possible sources of hatchery names were used, it is realized that some hatcheries may have been overlooked. However, the omissions are believed to be comparatively few and relatively small in egg capacity.

SUMMARY

1. The commercial hatchery industry had its inception in the 1880's and made a very gradual growth until about 1920. Since that year the industry has expanded rapidly, and this is shown by the fact that 87.6 percent of the hatcheries in existence in 1937-38 started after 1920.

2. During the period covered by this survey, August 1, 1937, through July 31, 1938, there were 10,533 commercial hatcheries found to be operating in all of the States, which is 872 less than were in existence in 1934. This decrease has occurred among those hatcheries with less than 25,000-egg capacity, and principally among those with

¹ Poultry Section, Agricultural Adjustment Administration. "An Economic Survey of the Baby Chick Hatchery Industry," 1935.

² This survey was conducted under a cooperative agreement with the Agricultural Marketing Service. Valuable advice and assistance were extended by Mr. B. H. Bennett, Dr. S. A. Jones and field representatives of the Agricultural Marketing Service. The authors wish to acknowledge the cooperation rendered by a special committee appointed by the International Baby Chick Association for the purpose of offering advice as to the type of information which would be most helpful to the poultry industry. Acknowledgment is also due to the Extension Service and its county agents and to the many thousands of hatcherymen who cooperated in furnishing data.

less than 10,000-egg capacity. The States with the greatest number of hatcheries are Ohio, Iowa, Texas, Pennsylvania, Illinois, Indiana, and New York, in which are located 39.8 percent of all the hatcheries and 43.2 percent of the total incubator capacity reported. Furthermore, commercial hatcheries were found to be operating in 2,113 of the 3,070 counties in the United States.

3. The total incubator capacity for the hatcheries operating in 1937-38 was 397,413,000 eggs. This represents an increase since 1934 of 121,126,000 eggs, or 43.8 percent. This increase in capacity has caused the average hatchery to increase in size from 24,200 in 1934 to 37,700 eggs in 1937-38, or 55.8 percent.

4. It is estimated that 781,745,000 chicks were hatched in the 1937-38 season in commercial hatcheries. This represents an increase since 1934 of 328,317,000 chicks, or 72.4 percent. Every State showed an increase, ranging from Washington's 14.7 percent to North Carolina's 367.5 percent.

5. The average percentage hatch increased from 63.9 in 1934 to 68.2 in 1937-38. This means that hatcherymen are now obtaining 4.3 more chicks from every 100 eggs set than they did in 1934. This increase in the rate of hatch of 6.7 percent represents approximately 49,000,000 chicks.

6. Nearly one-half of the hatcheries reported that they operate for periods of 4 or 5 months. The number of hatcheries operating for more than 6 months was 20.3 percent, while only 3.9 percent operated during the entire 12-month period. Over three-fourths of the hatcheries operated during the 4-month period of February to May.

7. Breeding flocks were owned by 62.1 percent of the hatcheries included in this study, and this represents an increase of 14.4 percent since 1934. It is estimated that there were 42,531,000 hens in all flocks which supplied hatching eggs to commercial hatcheries in 1937-38. This is an average of 107 hens for each 1,000-egg capacity.

8. From this survey it is estimated that 64.6 percent of all hatcheries did custom hatching.

9. Of the hatcheries reporting, 26.3 percent sold sex-separated chicks.

10. Cockerel chicks were destroyed by only 403 out of 5,824 hatcheries reporting, which is 6.9 percent.

11. From the replies received, it was found that 4,085 or 69.4 percent of the total sold started chicks.

12. The interstate aspect of this industry is shown by the fact that 22 percent of all hatcheries bought hatching eggs outside their State, and over 36 percent sold baby chicks in other States.

13. It is estimated that only about 10 percent of all hatcheries act as a dealer, agent, or salesman for other hatcheries in buying or selling hatching eggs and baby chicks.

14. Approximately 60 percent of hatcherymen reporting keep a record of their operating costs.

DEVELOPMENT OF HATCHERY INDUSTRY

The first reference found of a commercially operated hatchery was an advertisement appearing in a farm magazine in 1873, indicating that Jacob Graves of Boston was offering for sale 2- to 4-week old chicks. Of the hatcheries operating at the present time the one with

the longest record of continued operation is the Pioneer Hatchery of Petaluma, Calif., which was started by the late Christopher Nissen in 1880 and at first only custom-hatched chicks for neighbors. Four other of the present-day hatcheries reported operations beginning in 1882, 1888, 1888, and 1889, respectively. Consequently the period of the 80's can be considered as the beginning of the commercial hatchery industry.

Progress was slow at first and of the 5,786 hatcheries reporting in 1938, only 26 stated their business was operating in 1900. From that year until 1920, as shown in figure 1, there was a very gradual increase to 720 hatcheries in operation. Since 1920 the increase in

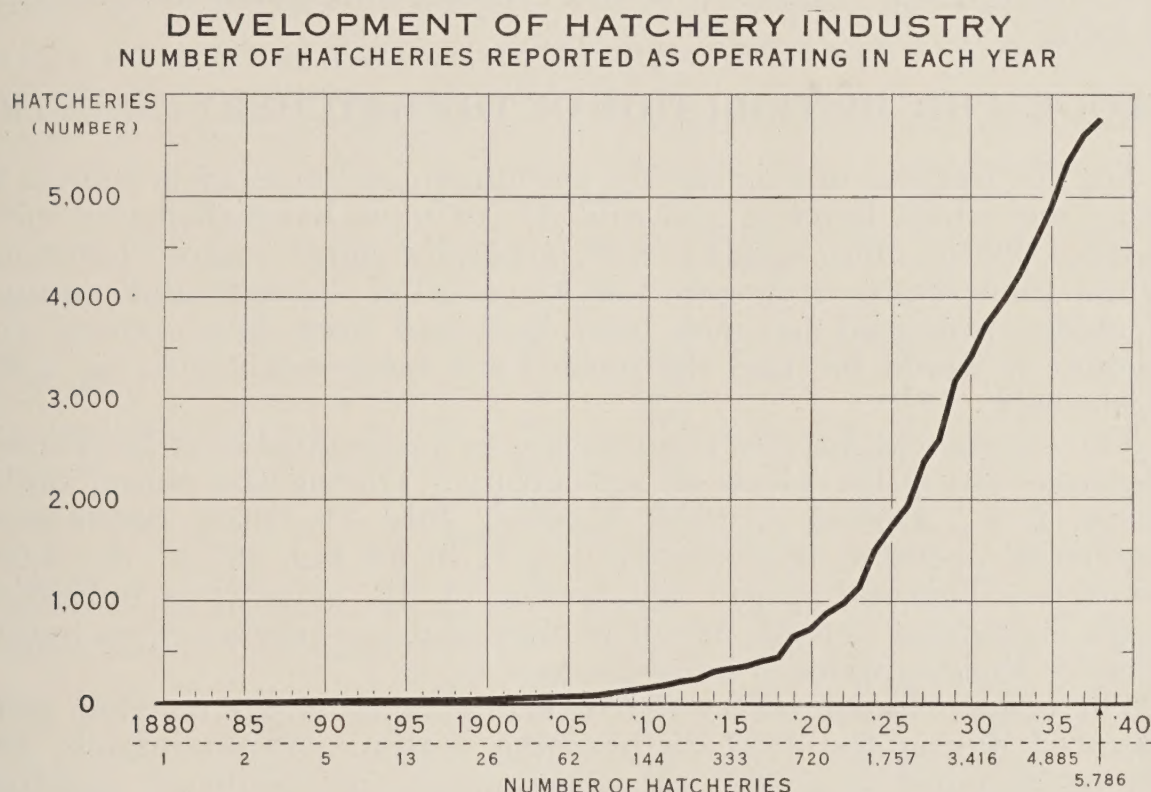


FIGURE 1.—The earliest commercial hatchery began operating in 1880, and from then until about 1920 the industry experienced only a gradual growth. From that time on, a rapid expansion has taken place. The sample basis for this growth curve is the returns from 5,786 or 55 percent of 10,533 hatcheries doing business in 1937-38.

numbers of hatcheries has been very rapid, as 87.6 percent of the hatcheries operating in 1937-38 started operation after that date. From 1920 to 1930 there were 2,696 hatcheries which were reported as starting in business. This represents 46.6 percent of those reporting during the period covered by this survey. From 1930 on there were 2,370 hatcheries which reported starting operation, representing 41 percent of those in business in 1937-38. The smallest number of new hatcheries starting operations in any one year since 1923 was the 168 hatcheries reporting as operating their first year in the 1937-38 period. It is believed that this is evidence of a recognition on the part of the poultry industry that the peak in the rapid increase in the number of hatcheries has been reached. The 20 years, 1920-40, it is believed will go down in the history of the poultry industry as the period of greatest expansion in the number of commercial chick hatcheries.

In 1892 the first shipment of chicks by express was successfully made by Joseph D. Wilson of Stockton, N. J. This demonstrated the possibility of producing chicks in one locality and shipping them to a distant point. The containers used for shipping chicks were crude heavy boxes. In 1907 there were introduced chick boxes made of corrugated paper board. In 1908 oil- and coal-burning canopy types of brooders were introduced making possible the efficient brooding of chicks in large numbers. Baby chicks were admitted to the mails as parcel post matter in 1918 and the cost of shipping was thereby greatly reduced. The cabinet type of incubator, with forced draft circulation of air and accommodating eggs in different stage of incubation, was patented in 1918. Machines of this type were marketed commercially in 1922.³

GEOGRAPHIC DISTRIBUTION OF THE HATCHERY INDUSTRY

For the purpose of this survey, a commercial hatchery is defined as being one which hatched and sold 500 or more baby chicks, or incubated 1,000 or more eggs for hire, generally called custom hatching. While these limits may seem low, the total of the estimated number of chicks produced has not been increased very much above the amount it would be, had the lower limit been established as 1,000 chicks sold.

The commercial hatchery industry is as widespread over the United States as any other phase of agriculture. During the period under study, i. e., August 1, 1937, through July 31, 1938, commercial hatcheries operated in every State and in all but 957 of the 3,070 counties. This widespread distribution of the industry is indicative of the increasing dependence of poultry and egg producers on hatcheries for their supplies of baby chicks.

There were found to be 10,533 commercial hatcheries that were operated during the 1937-38 hatching season. Approximately 100 hatcheries failed to answer the questionnaire on incubator capacity, and no doubt there is a small number of plants for which there is no available record of existence. It is believed, however, that the omissions are relatively few and the data presented in this publication are not materially affected by them.

In addition to the 10,533 hatcheries mentioned above, 1,105 hatcheries were found that did not operate at any time during the year, and 164 hatcheries were known to be engaged exclusively in hatching turkey poults or ducklings. A large number of hatcheries were also found that were being operated for the exclusive use of the owner, or were selling or custom hatching fewer chicks or eggs than the minimums established and previously mentioned. These three groups of hatcheries have not been included in this study.

DISTRIBUTION

Table 1 shows the number of hatcheries by States and geographic regions for the 1937-38 hatching season as well as for the 1934 season. For the country as a whole, the total number of hatcheries has decreased by 872, or 7.6 percent, since 1934. The significance of this

³ The historical facts presented briefly above were taken from papers presented by E. A. Nisson on the Popular Program and by B. H. Bennett and C. C. Warren on the Scientific Program at the Seventh World's Poultry Congress, Cleveland, Ohio, 1939.

decrease, however, is questionable in some respects. It is not known for instance, how many hatcheries included in the 1934 total were not in operation at that time. According to estimates made by the Agricultural Marketing Service,⁴ 1934 was the year of lowest hatchery production since 1929, when information on this subject was first obtained. In conducting the present survey, 707 hatcheries were found to be operated for the exclusive use of the owner, but had been included in the 1934 survey as commercial hatcheries. Since most of these 707 plants were quite small, it is likely that many of them were selling baby chicks in 1934 and have subsequently been withdrawn from commercial operations. Many, however, should probably not have been included in the former survey.⁵

TABLE 1.—*Geographical distribution of the hatchery industry in the United States, 1934 and 1937-38*

State and region	Number of hatcheries			Total egg capacity		
	1934	1937-38	Percent change	1934	1937-38	Percent increase
				1,000	1,000	
Maine.....	190	204	+7.4	1,190	1,739	46.1
New Hampshire.....	145	202	+39.3	1,825	2,964	62.4
Vermont.....	56	54	-3.6	316	537	69.9
Massachusetts.....	319	360	+12.9	3,888	5,592	43.8
Rhode Island.....	37	54	+45.9	321	581	81.0
Connecticut.....	144	143	-.7	2,532	4,386	73.2
New England.....	891	1,017	+14.1	10,072	15,799	56.9
New York.....	510	521	+2.2	7,135	9,729	36.4
New Jersey.....	224	213	-4.9	5,411	7,775	43.7
Pennsylvania.....	635	592	-6.8	14,445	18,909	30.9
Middle Atlantic.....	1,369	1,326	-3.1	26,991	36,413	34.9
Ohio.....	831	687	-17.3	27,529	30,831	12.0
Indiana.....	609	540	-11.3	17,107	28,652	67.5
Illinois.....	600	542	-9.7	20,717	29,811	43.9
Michigan.....	444	368	-17.1	10,759	12,853	19.5
Wisconsin.....	473	376	-20.5	9,266	12,756	37.7
East North Central.....	2,957	2,513	-15.0	85,378	114,903	34.6
Minnesota.....	458	472	+3.1	15,497	24,798	60.0
Iowa.....	757	681	-10.0	21,535	35,690	65.7
Missouri.....	572	417	-27.1	18,415	24,713	34.2
North Dakota.....	50	55	+10.0	1,003	1,775	77.0
South Dakota.....	124	116	-6.5	3,608	4,995	38.4
Nebraska.....	330	259	-21.5	9,487	14,230	50.0
Kansas.....	595	414	-30.4	13,809	17,034	23.4
West North Central.....	2,886	2,414	-16.4	83,354	123,235	47.8
Delaware.....	53	49	-7.5	1,854	2,320	25.1
Maryland.....	131	137	+4.6	2,835	5,038	77.7
District of Columbia.....	2	2	0	33	37	12.1
Virginia.....	179	172	-3.9	3,864	6,504	68.3
West Virginia.....	49	62	+26.5	474	1,335	181.6
North Carolina.....	104	130	+25.0	1,273	3,595	182.4
South Carolina.....	66	66	0	1,047	1,715	63.8
Georgia.....	102	104	+2.0	1,316	2,572	95.4
Florida.....	79	88	+11.4	1,004	1,698	69.1
South Atlantic.....	765	810	+5.9	13,700	24,814	81.1

⁴ Prior to July 1, 1939, these estimates were made by the Bureau of Agricultural Economics.

⁵ The 1934 survey was based entirely on the names and capacities of hatcheries as shown on the mailing list of the NRA code for the baby chick hatchery industry. It is generally accepted that many small hatcheries registered with the code authorities even though their production was lower than the minimum required, i. e., hatching and selling 500 or more baby chicks or custom hatching 1,000 or more eggs.

TABLE 1.—*Geographical distribution of the hatchery industry in the United States, 1934 and 1937-38—Continued*

State and region	Number of hatcheries			Total egg capacity		
	1934	1937-38	Percent change	1934	1937-38	Percent increase
Kentucky.....	89	99	+11.2	1,000 1,733	1,000 3,576	106.3
Tennessee.....	64	109	+70.3	2,113	3,836	81.5
Alabama.....	80	99	+23.8	1,066	1,774	66.4
Mississippi.....	62	55	-11.3	888	1,386	56.1
East South Central.....	295	362	+22.7	5,800	10,572	82.3
Arkansas.....	62	89	+43.5	869	2,321	167.1
Louisiana.....	34	37	+8.8	505	824	63.2
Oklahoma.....	237	215	-9.3	6,114	7,962	30.2
Texas.....	603	634	+5.1	12,524	17,914	43.0
West South Central.....	936	975	+4.2	20,012	29,021	45.0
Montana.....	18	21	+16.7	288	402	39.6
Idaho.....	62	50	-19.4	1,180	1,428	21.0
Wyoming.....	8	11	+37.5	156	236	51.3
Colorado.....	105	89	-15.2	2,412	3,575	48.2
New Mexico.....	16	13	-18.8	470	548	16.6
Arizona.....	25	25	0	470	716	52.3
Utah.....	41	27	-34.1	1,474	1,798	22.0
Nevada.....	2	4	+100.0	23	80	247.8
Mountain.....	277	240	-13.4	6,473	8,783	35.7
Washington.....	240	193	-19.6	5,331	6,158	15.5
Oregon.....	214	187	-12.6	3,456	5,388	55.9
California.....	575	496	-13.7	15,720	22,327	42.0
Pacific.....	1,029	876	-14.9	24,507	33,873	38.2
UNITED STATES.....	11,405	10,533	-7.6	276,287	397,413	43.8

It is interesting to note that in spite of the decline from 1934 of 7.6 percent in the total number of hatcheries, some regions of the country showed increases. In the New England States, for instance, the number of hatcheries increased by 126 or 14.1 percent. The States south of the Ohio River and west to Texas generally showed increases. The States comprising the South Atlantic, East South Central and the West South Central regions showed a net increase of 151 hatcheries or 7.6 percent. Outside of these four regions significant declines in the number of hatcheries occurred, ranging as high as 16.4 percent in the West North Central region.

CAPACITIES

Table 1 also shows the incubator capacity of all hatcheries, by States and regions, for 1937-38 and 1934. For the country as a whole there has been an increase of 121,126,000 in egg capacity or 43.8 percent during the 4-year period. While this may seem to be too great an increase in capacity to have occurred in only 4 years, it is largely substantiated by the fact that incubators of more than a 1,000-egg capacity each, comprising a total capacity of 111,450,000 eggs, were manufactured during the period 1935 to 1938, inclusive.⁶ In addition to this there were 70,021 incubators of less than a 1,000-egg capacity manufactured but it is believed that very few of these incubators are in use in commercial hatcheries. It seems, therefore, that the increase shown in capacity of the industry was greater than the capacity of new incubators manufactured. It should be noted, moreover, that the capacities shown in the 1934 survey were those

⁶ Bureau of the Census, U. S. Department of Commerce.

that had been placed on file with the code authorities of the hatchery industry, and hatcherymen were only required to report their capacity that was actually being used. Since 1934 was, as mentioned previously, the year of lowest output since 1929, there was probably a large volume of idle capacity that year. This idle capacity was not reported to the code authority and consequently not shown in the 1934 survey.

All nine geographic regions showed marked increases in total capacity, the smallest increase occurring in the Middle Atlantic region where capacity increased 34.6 percent. The South Atlantic and the East South Central regions showed the greatest percentage increases. These were 81.1 and 82.3 percent, respectively. In total capacity the West North Central region leads all others with a total of 123,235,000 eggs, followed by the East North Central region with 114,903,000 eggs.

CAPACITY CLASSIFICATION

In order to more properly study the decrease in the number of hatcheries and the increase in capacity, the 10,533 hatcheries were divided into nine capacity classes or size-groups. The number in each group with the respective capacities is shown in table 2. This table shows that the decrease in the total number of hatcheries occurred principally among those with less than a 10,000-egg capacity, and to a limited extent in the group with capacities ranging from 10,000 to 24,900 eggs. In all other groups, striking percentage increases have occurred. In 1937-38 the most numerous group of hatcheries ranged in size from 10,000 to 24,900 eggs, while in 1934 those hatcheries with capacities under 10,000 eggs were by far the most numerous group.

Generally the same observations can be made concerning changes in capacities. Declines in capacity have occurred in those size-groups below 24,900 eggs and marked increases in all the groups above this amount. In 1937-38 the greatest aggregate capacity is found in the group of hatcheries ranging in size from 100,000 to 199,900 eggs each, while in 1934 the group ranging from 10,000 to 24,900 eggs had the greatest capacity. This marked shift in the predominant size-group, together with a decrease in the total number of plants has caused the average capacity per plant to increase from 24,200 in 1934 to 37,700 eggs in 1937-38, or 55.8 percent.

TABLE 2.—Relative importance of nine size-groups of hatcheries, 1934 compared to 1937-38

Size-group (1000 eggs)	Number of hatcheries			Total egg capacity		
	1934	1937-38	Percent change	1934	1937-38	Percent change
Under 5.0-----	4, 934	1, 450	{ -41. 9	1,000	1,000	{ -28. 5
5.0-9.9-----		1, 417		19, 110	3, 756	
10.0-24.9-----		3, 025		50, 774	9, 917	
25.0-39.9-----		3, 315		48, 168	54, 108	
40.0-59.9-----		1, 274		39, 370	61, 124	
60.0-99.9-----		895		42, 481	66, 826	
100.0-199.9-----		576		44, 744	69, 816	
200.0-499.9-----		294		38, 790	52, 905	
500.0 and over-----		102		28, 946	30, 793	
All size-groups-----	11, 405	10, 533	-7. 6	276, 287	397, 413	43. 8
	15	40	+166. 7	12, 072		+155. 1

ESTIMATED CHICK PRODUCTION

In requesting data from hatcherymen on the number of eggs set and chicks hatched in the 1937-38 season, space was also provided on the questionnaire for the number of turkey and duck eggs set and the number of poults and goslings hatched. The data presented in table 3, however, show only the number of baby chicks hatched. Since it was believed that the number of eggs set, and consequently the number of chicks hatched per unit-capacity, might vary with the size of hatchery, an attempt was made to obtain not only as many replies as possible to the questionnaire from each State, but also a representative number of responses from each hatchery size-group within each State. Usable replies were received from 5,774 out of the total of 10,533 hatcheries, or 54.8 percent, and the total estimated production of chicks is therefore based on these returns. Generally speaking, the production of hatcheries not replying to the questionnaire was estimated to have been at approximately the same rate as that of those replying in the same capacity size-group in the same State.

TABLE 3.—*Estimated number of salable baby chicks produced in 1937-38, compared to 1934*

State and region	Estimated production of salable baby chicks		
	1934	1937-38	Percent increase
	<i>1,000</i>	<i>1,000</i>	
Maine.....	1,893	4,223	123.1
New Hampshire.....	3,088	9,318	201.7
Vermont.....	348	1,324	280.5
Massachusetts.....	7,622	14,769	93.8
Rhode Island.....	537	1,368	154.7
Connecticut.....	5,466	18,300	234.8
New England.....	18,954	49,302	160.1
New York.....	6,606	16,050	143.0
New Jersey.....	7,624	18,306	140.1
Pennsylvania.....	28,757	36,245	26.0
Middle Atlantic.....	42,987	70,601	64.2
Ohio.....	50,306	59,805	18.9
Indiana.....	25,111	66,662	165.5
Illinois.....	39,271	55,510	41.4
Michigan.....	19,230	22,061	14.7
Wisconsin.....	12,598	18,748	48.8
East North Central.....	146,516	222,786	52.1
Minnesota.....	22,083	34,375	55.7
Iowa.....	33,638	67,052	99.3
Missouri.....	43,044	61,189	42.2
North Dakota.....	941	2,470	162.5
South Dakota.....	4,558	8,924	95.8
Nebraska.....	17,686	24,471	38.4
Kansas.....	19,993	30,588	53.0
West North Central.....	141,943	229,069	61.4
Delaware.....	4,473	5,843	30.6
Maryland.....	5,272	15,202	188.4
District of Columbia.....	61	58	-4.9
Virginia.....	8,327	15,355	84.4
West Virginia.....	719	2,922	306.4
North Carolina.....	1,943	9,084	367.5
South Carolina.....	1,815	3,844	111.8
Georgia.....	2,664	6,161	131.3
Florida.....	1,594	5,322	233.9
South Atlantic.....	26,868	63,791	137.4

TABLE 3.—*Estimated number of salable baby chicks produced in 1937-38, compared to 1934—Continued*

State and region	Estimated production of salable baby chicks		
	1934	1937-38	Percent increase
	1,000	1,000	
Kentucky.....	2,702	6,948	157.1
Tennessee.....	3,072	8,698	183.1
Alabama.....	2,316	4,362	88.3
Mississippi.....	1,562	3,490	123.4
East South Central.....	9,652	23,498	143.5
Arkansas.....	1,207	4,935	308.9
Louisiana.....	582	2,083	257.9
Oklahoma.....	6,881	14,567	111.7
Texas.....	13,056	34,992	168.0
West South Central.....	21,726	56,577	160.4
Montana.....	393	686	74.6
Idaho.....	1,788	2,328	30.2
Wyoming.....	236	344	45.8
Colorado.....	4,523	6,634	46.7
New Mexico.....	611	985	61.2
Arizona.....	591	1,317	122.8
Utah.....	1,451	1,851	27.6
Nevada.....	32	117	265.6
Mountain.....	9,625	14,262	48.2
Washington.....	7,917	9,079	14.7
Oregon.....	4,521	6,316	39.7
California.....	22,719	36,464	60.5
Pacific.....	35,157	51,859	47.5
UNITED STATES.....	453,428	781,745	72.4

As shown in table 3, it is estimated that a total of 781,745,000 chicks was hatched in the 1937-38 season. This represents an increase since 1934 of 72.4 percent, or 328,317,000 chicks. This huge increase represents in part a shift from farm hatched to commercially hatched chicks and does not represent a corresponding expansion in the number of chickens raised. Between 1934 and 1938 there was an increase of only 7 percent in the number of chickens raised on farms. Instead, the increase in hatchery chick production has occurred because the poultry industry has become more highly specialized. A much greater proportion of the total number of chickens raised is now being produced from chicks hatched by commercial hatcheries than was formerly the case. In 1934 the Bureau of Agricultural Economics estimated that about 46.6 percent of the chicks produced that year was either bought from commercial hatcheries or custom hatched by them. While no definite estimates were made for 1938, indications show that probably more than 60 percent of the chicks produced was either bought from or custom hatched by commercial hatcheries. This increase in the proportions bought will in itself account for a major proportion of the increased production of chicks.

Another reason for the increased chick production has been the rapid growth of broiler production on a commercial scale during the last few years. Estimates of the volume of this production range between 60 and 80 million broilers a year, which, with an assumed

mortality of 20 percent, would require between 75 and 100 million chicks annually. While perhaps 60 percent of all farm chicks come from commercial hatcheries, practically 100 percent of broiler chicks are obtained from this source.

EXTENT OF INCREASE

Examination of table 3 shows that increases in the number of chicks hatched commercially since 1934 have occurred in every State. Washington's increase of 14.7 percent was the lowest and North Carolina's increase of 367.5 percent was the highest. The West South Central States showed the greatest regional increase—160.4 percent—followed closely by the New England region with an increase of 160.0 percent. The two regions with the next highest percentage increase were the South Atlantic and the East South Central. It can be seen, therefore, that the greatest percentage expansion in chick production has occurred in two distinct areas; in the whole southeastern part of the country extending as far west as Texas and Oklahoma and also in the New England States.

The increase in the Southeastern States has occurred for the same general reasons as mentioned above for the whole United States. An additional reason, however, is that while in the past the Southeast has been dependent to quite a great extent on chicks hatched in other sections of the country this dependency appears to be rapidly declining. This is evidenced by the fact that in 1934 hatcheries in this area hatched only about 27 chicks for every 100 chickens raised in that year, while in 1938 there were nearly 53 chicks hatched per 100 chickens raised.

The increase in the New England States is probably due to at least two important factors. These factors are the growth of the broiler industry in this area and an increase in shipments of chicks to other broiler-producing areas as well as shipments of large quantities of breeding stock from the many breeders in these States.

The West North Central region is now the leading producer of chicks, having displaced the East North Central States since 1934. Iowa, with an increase of nearly 100 percent since 1934, now leads all other States in hatchery chick production. Ohio which ranked first in 1934 now ranks fourth in importance.

PRICES PAID

Table 4 shows, by States and geographic regions, the average prices paid by farmers for 100 baby chicks and also the estimated total value of all the commercially hatched baby chicks. The average baby-chick prices, as shown by States, are published annually by the Agricultural Marketing Service and are the prices paid by farmers for baby chicks during the first 4 months of 1938. The regional average prices were computed on the basis of the number of chicks hatched in the region. It is interesting to note that baby chick prices are definitely highest in the New England and Pacific Coast States. It is in these two areas, of course, that commercial production of chicks and eggs is the most advanced.

Table 4 shows that the estimated value of all commercially hatched chicks in the United States was \$70,007,000. This, however, should not be thought of as the total cash income of commercial hatcheries.

This total includes the value of all baby chicks, whether sold, custom hatched, or used by hatcherymen themselves.

While it is shown in table 3 that Iowa produced the greatest number of baby chicks, table 4 shows that the estimated total value of chicks produced in Indiana was the greatest. The next three highest States in total value are Ohio, Iowa, and Illinois.

TABLE 4.—Average price paid by farmers in 1938 for 100 chicks ¹ and total value of chicks produced in 1937-38, by States and regions

State and region	Average price for 100 chicks 1938	Total value of hatchery chicks 1937-38	State and region	Average price for 100 chicks 1938	Total value of hatchery chicks 1937-38
	<i>Dollars</i>	<i>1,000 dollars</i>		<i>Dollars</i>	<i>1,000 dollars</i>
Maine.....	11.30	477	South Carolina.....	8.10	311
New Hampshire.....	11.80	1,100	Georgia.....	8.30	512
Vermont.....	11.10	147	Florida.....	9.00	479
Massachusetts.....	10.80	1,595	South Atlantic.....	8.77	5,595
Rhode Island.....	11.90	163	Kentucky.....	8.10	563
Connecticut.....	12.00	2,196	Tennessee.....	7.90	687
New England.....	11.52	5,678	Alabama.....	8.10	353
New York.....	10.80	1,733	Mississippi.....	8.30	290
New Jersey.....	10.90	1,995	East South Central.....	8.06	1,893
Pennsylvania.....	9.30	3,371	Arkansas.....	7.70	380
Middle Atlantic.....	10.06	7,099	Louisiana.....	8.30	173
Ohio.....	9.20	5,502	Oklahoma.....	7.80	1,136
Indiana.....	8.40	5,600	Texas.....	7.70	2,694
Illinois.....	8.40	4,663	West South Central.....	7.75	4,383
Michigan.....	9.80	2,162	Montana.....	11.00	75
Wisconsin.....	9.80	1,837	Idaho.....	10.30	240
East North Central.....	8.87	19,764	Wyoming.....	9.70	33
Minnesota.....	8.70	2,991	Colorado.....	8.60	571
Iowa.....	8.00	5,364	New Mexico.....	9.30	92
Missouri.....	7.50	4,589	Arizona.....	11.70	154
North Dakota.....	9.40	232	Utah.....	10.30	191
South Dakota.....	8.60	768	Nevada.....	9.50	11
Nebraska.....	7.70	1,884	Mountain.....	9.58	1,367
Kansas.....	7.80	2,386	Washington.....	12.00	1,089
West North Central.....	7.95	18,214	Oregon.....	11.00	695
Delaware.....	8.90	520	California.....	11.60	4,230
Maryland.....	8.90	1,353	Pacific.....	11.60	6,014
Virginia.....	9.00	1,382	UNITED STATES.....	8.96	70,007
West Virginia.....	8.80	257			
North Carolina.....	8.60	781			

¹ Agricultural Marketing Service.

The average value of hatchery chicks bought by farmers in the West South Central region was \$7.75 per 100 and is the lowest regional price in the country. This is in spite of the fact that the production of hatchery chicks in this area since 1934 has shown a greater percentage increase than has that of any other region.

PROFIT FACTORS

Although many elements enter into a determination of the profitability of producing baby chicks, two basic elements are—the number of times the total capacity of the hatchery is utilized during the year and the number of chicks hatched per 100 eggs set. The rate of utilization or, as expressed in tables 4 and 5, the number of eggs set

per unit-capacity, depends on the length of the hatching season for a particular locality or area and the demand for chicks during a given season. The percentage hatch, while being partially a plant management problem, is also a matter of selecting good breeding stock for high hatchability.

TABLE 5.—Estimated number of eggs set per unit-capacity and the percentage hatch, 1934 compared to 1937-38

State and region	Eggs set per unit-capacity			Percentage hatch		
	1934	1937-38	Percent change	1934	1937-38	Percent increase
Maine.....	2.41	3.41	+41.5	66.0	71.3	8.0
New Hampshire.....	2.47	4.32	+74.9	68.5	72.7	6.1
Vermont.....	1.83	3.39	+85.2	60.2	72.8	20.9
Massachusetts.....	3.03	3.66	+20.8	64.7	72.2	11.6
Rhode Island.....	2.59	3.43	+32.4	64.6	68.6	6.2
Connecticut.....	3.51	6.08	+73.2	61.5	68.6	11.5
New England.....	2.92	4.41	+51.0	64.4	70.8	9.9
New York.....	1.63	2.50	+53.4	56.8	66.1	16.4
New Jersey.....	2.31	3.43	+48.5	61.0	68.6	12.5
Pennsylvania.....	3.16	2.91	-7.9	63.0	65.8	4.4
Middle Atlantic.....	2.59	2.91	+12.4	61.6	66.6	8.1
Ohio.....	2.82	2.89	+2.5	64.8	67.1	3.5
Indiana.....	2.29	3.42	+49.3	64.1	67.9	5.9
Illinois.....	2.80	2.71	-3.2	67.7	68.7	1.5
Michigan.....	2.93	2.66	-9.2	61.0	64.7	6.1
Wisconsin.....	2.20	2.21	+5	61.8	66.4	7.4
East North Central.....	2.66	2.88	+8.3	64.6	67.4	4.3
Minnesota.....	2.23	2.15	-3.6	63.9	64.4	.8
Iowa.....	2.75	2.71	-1.5	56.8	69.3	22.0
Missouri.....	3.77	3.52	-6.6	62.0	70.3	13.4
North Dakota.....	1.56	2.11	+35.3	60.1	66.0	9.8
South Dakota.....	1.88	2.66	+41.5	67.2	67.2	0
Nebraska.....	2.77	2.54	-8.3	67.3	67.6	.4
Kansas.....	2.28	2.56	+12.3	63.5	70.1	10.4
West North Central.....	2.75	2.71	-1.5	61.9	68.6	10.8
Delaware.....	3.70	3.60	-2.7	65.2	69.9	7.2
Maryland.....	2.91	4.40	+51.2	63.9	68.6	7.4
District of Columbia.....	2.91	2.22	-23.7	63.9	70.7	10.6
Virginia.....	3.28	3.40	+3.7	65.7	69.4	5.6
West Virginia.....	2.30	3.11	+35.2	66.0	70.3	6.5
North Carolina.....	2.19	3.53	+61.2	69.7	71.5	2.6
South Carolina.....	2.52	3.13	+24.2	68.8	71.7	4.2
Georgia.....	2.90	3.44	+18.6	69.8	69.7	-.1
Florida.....	2.50	4.47	+78.8	63.5	70.0	10.2
South Atlantic.....	2.97	3.68	+23.9	66.0	69.8	5.8
Kentucky.....	2.44	2.78	+13.9	63.9	69.8	9.2
Tennessee.....	2.23	3.23	+44.8	65.2	70.2	7.7
Alabama.....	3.19	3.52	+10.3	68.1	69.8	2.5
Mississippi.....	2.36	3.68	+55.9	74.5	68.3	-8.3
East South Central.....	2.49	3.19	+28.1	66.9	69.7	4.2
Arkansas.....	1.83	3.00	+63.9	75.9	70.8	-6.7
Louisiana.....	1.84	3.70	+101.1	62.7	68.3	8.9
Oklahoma.....	1.83	2.62	+43.2	61.5	69.9	13.7
Texas.....	1.57	2.79	+77.7	66.4	70.0	5.4
West South Central.....	1.67	2.79	+67.1	65.1	70.0	7.5
Montana.....	2.21	2.56	+15.8	61.8	66.8	8.1
Idaho.....	2.56	2.43	-5.1	59.2	67.2	13.5
Wyoming.....	2.95	2.32	-21.4	51.3	62.9	22.6
Colorado.....	3.02	2.72	-9.9	62.1	68.2	9.8
New Mexico.....	2.08	2.61	+25.5	62.5	68.8	10.1
Arizona.....	2.14	2.70	+26.2	58.7	68.2	16.2
Utah.....	1.68	1.65	-1.8	58.6	62.3	6.3
Nevada.....	2.21	2.04	-7.7	61.8	71.8	16.2
Mountain.....	2.46	2.42	-1.6	60.5	67.1	10.9
Washington.....	2.23	2.18	-2.2	66.6	67.7	1.7
Oregon.....	2.24	1.70	-24.1	58.4	69.0	18.2
California.....	2.22	2.54	+14.4	65.1	64.4	-1.1
Pacific.....	2.22	2.34	+5.4	64.5	65.5	1.6
UNITED STATES.....	2.61	2.88	+10.3	63.9	68.2	6.7

Table 5 shows by States and regions the estimated number of eggs set per unit-capacity and the percentage of the total eggs set that hatched in both 1934 and 1937-38. In the latter period, the estimated average eggs set per unit-capacity for the United States was 2.88 eggs, or an increase of 10.3 percent above the 2.61 eggs reported in 1934. Declines occurred in 15 States, principally in the West North Central, the Mountain, and the Pacific regions. In about half of these 15 States, however, declines occurred from levels which were considerably above the average for their respective regions in 1934. The New England States, setting an average of 4.41 eggs per unit-capacity, led all other regions. This high rate of utilization was partially caused by the State of Connecticut, where the production of broiler chicks is very important. The West South Central region showed the greatest increase in 1937-38 over 1934 in eggs set per unit-capacity.

RATE OF HATCH

The section of table 5 showing the percentage hatch in 1934 and in 1937-38 is of primary interest. Of first importance is the fact that during that 4-year period the average percentage hatch has increased from 63.9 to 68.2 percent. In other words, hatcherymen obtained 4.3 more chicks from every 100 eggs set than they did in 1934. This increase in the percentage hatch of 6.7 percent represented a definite lowering of the cost of producing chicks. Approximately 49,000,000 more chicks were hatched from the total number of eggs set than would have been the case had the 1934 percentage hatch been experienced. If these chicks are valued at 8.95 cents each, the United States average price in 1938, the hatchery industry has lowered its total costs in this one respect by about \$4,400,000.

The New England States experienced the highest percentage hatch with 70.8 percent, followed by the West South Central region with 70.0 percent. The three States on the Pacific coast showed the lowest percentage hatch, although in 1934 these States were slightly above the New England region. A possible explanation of this lower-than-average hatch on the West coast is the fact that sexing chicks and destroying excess cockerels are practiced there on a much wider scale than elsewhere. An analysis of individual returns from these States strongly indicates the possibility that some hatcherymen reported the number of chicks sold rather than the total number hatched. If this is true, then of course the destroyed cockerels were not reported, and consequently the percentage hatch was reduced.

It is interesting to observe that there is less variation in the percentage hatch between States in 1937-38 than there was in 1934. In the New England region in 1934, for instance, there was a variation from 60.2 percent to 68.5 percent, a range of about 8 points. In 1937-38, however, there was a range of only approximately 4 points. In 1934, Arkansas had the highest percentage hatch with 75.9, while Wyoming had the lowest with 51.3, which is a spread of 24.6 points. In 1937-38, the highest percentage hatch was 72.8 for Vermont and the lowest was 62.3 for Utah, which is a spread of only 10.5 points. This reduction in the variation between States probably indicates an improvement in, and a more widespread use of good breeding stock, as well as improved hatching technique.

CAPACITY CLASSIFICATION

Table 6 shows, by capacity classes, the total number of chicks hatched, the number of eggs set per unit-capacity, and the average percentage hatch. The comparable 1934 data are not available for inclusion in this table. Hatcheries with less than 10,000-egg capacity produced only 3.1 percent of the estimated total number of salable chicks hatched. The hatcheries with capacities ranging between 100,000 and 199,900 eggs produced 17.2 percent of the total number of chicks. This is a larger proportion than that produced by any other size-group.

As for the number of eggs set per unit-capacity, there is a slight increase as the size of the hatchery becomes greater. This upward tendency, however, does not appear to begin until hatcheries have a minimum size of about 60,000-egg capacity. Below this figure there does not seem to be a significant change between size-groups.

There appears to be no significant relationship between the percentage hatch and the size of a hatchery. However, the five medium size groups, 25,000 to 500,000 eggs, show a slightly smaller percentage hatch than do either the smaller or the larger groups. This may be related to the percentage of hatcheries owning their own flocks which, as table 9 shows, was the lowest in these groups. The vast majority of specialized breeders are found in the smaller size-groups and this might account for the higher percentage hatch among the smaller plants.

TABLE 6.—*Salable chicks hatched, eggs set per unit-capacity, and percentage hatch, 1937-38, by size-groups*

Size-group (1,000 eggs)	Salable chicks hatched		Eggs set per unit-capacity	
	Number	Percent of total	Number	Percent hatched
	1,000			
Under 5.0.....	6,855	0.9	2.65	68.9
5.0-9.9.....	17,000	2.2	2.49	68.8
10.0-24.9.....	85,520	10.9	2.58	68.8
25.0-39.9.....	95,160	12.2	2.58	68.1
40.0-59.9.....	107,388	13.7	2.59	67.8
60.0-99.9.....	124,322	15.9	2.74	67.9
100.0-199.9.....	134,208	17.2	2.84	67.6
200.0-499.9.....	128,311	16.4	3.55	68.3
500.0 and over.....	82,981	10.6	3.90	69.1
All size-groups.....	781,745	100.0	2.88	68.2

HATCHERY OPERATING MONTHS

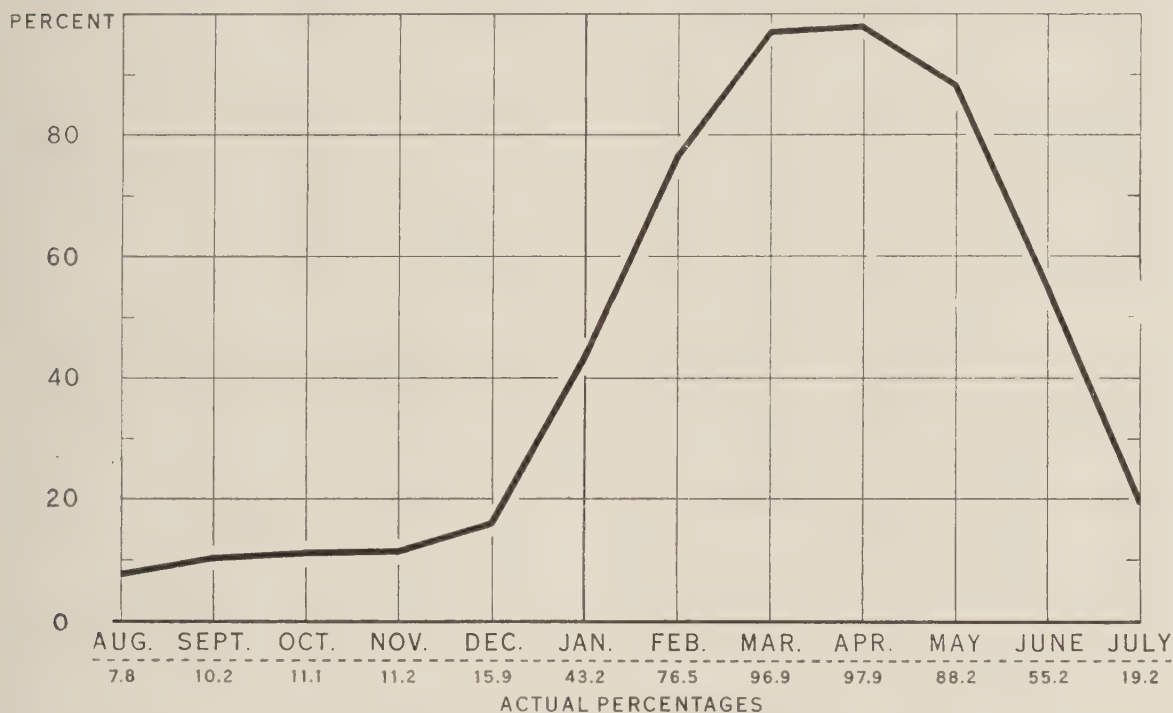
Nearly one-half of the hatcheries have an operating season of 4 or 5 months. Table 7 shows that 24.6 percent of the 5,907 hatcheries which reported their operating period, operated for 4 months, and 24.4 percent operated for 5 months. The number of hatcheries reporting operations for more than 6 months was 20.3 percent, and 3.9 percent reported operating during the entire 12-month period. Table 7 shows further that as the size of the hatchery increases the period of operation tends to be longer. In the eastern and far west-

ern sections of the country a larger percent of hatcheries operate over longer periods of the year than is true in the central part of the country.

OPERATING VARIATIONS

Figure 2 shows the percentage of hatcheries reporting operation in each month of the year starting in August 1937. Nearly all of the hatcheries were operating in March and April, and over three-fourths

PERCENTAGE OF HATCHERIES OPERATING EACH MONTH, 1937-38 *



*BASED ON RETURNS FROM 5,907 HATCHERIES

FIGURE 2.—More than three-fourths of the hatcheries operated during the period February through May. Approximately 10 percent of all hatcheries, principally among the larger size-groups, operated during the “off-season” from August through December. This comparatively new development has been brought about by the increased demand for broiler chicks during that season of the year.

of them operated during the 4-month period, February, March, April, and May. Only 7.8 percent of the hatcheries operated in August, and it was for this reason that the period covered by this survey began on August 1.

The importance of the various months of the year, as measured by the percentage of hatcheries reporting as operating in each month, varies in different areas of the country. There were three areas with a similar operating period for the year, these being the New England, South Atlantic, and Pacific regions.

TABLE 7.—*Regional percentage of hatcheries reporting period of operation, by number of months, 1937-38*¹

Region	Number of months hatcheries operated												
	One	Two	Three	Four	Five	Six	Seven	Eight	Nine	Ten	Eleven	Twelve	Total
New England.....	0.5	5.2	10.8	16.7	21.9	15.2	9.8	6.5	3.1	3.4	1.7	5.2	100.0
Middle Atlantic.....	.2	3.8	15.6	20.3	23.2	15.8	9.4	2.4	1.5	1.8	1.6	4.4	100.0
East North Central.....	.1	2.8	12.6	23.3	24.0	16.1	9.7	3.2	1.3	1.2	.4	2.3	100.0
West North Central.....	.3	3.2	14.4	32.4	29.7	11.1	4.2	1.2	.7	.8	.8	1.2	100.0
South Atlantic.....	0	4.5	9.5	20.3	19.3	12.7	7.2	3.7	4.9	5.7	2.7	9.5	100.0
East South Central.....	0	2.0	12.1	25.2	27.2	17.0	5.8	3.9	2.4	1.9	1.0	1.5	100.0
West South Central.....	.2	1.2	9.1	24.8	26.4	15.3	7.9	3.7	3.9	3.0	1.6	2.9	100.0
Mountain.....	0	1.4	12.7	21.1	28.9	24.0	7.0	1.4	.7	.7	.7	1.4	100.0
Pacific.....	.6	4.1	13.4	19.8	17.0	12.2	6.6	5.2	4.8	3.1	2.7	10.5	100.0
UNITED STATES.....	.3	3.3	12.7	24.6	24.4	14.4	7.6	3.2	2.2	2.1	1.3	3.9	100.0

¹ Based on replies from 5,907 hatcheries.

In five regions—New England, South Atlantic, East South Central, West South Central, and Pacific—a similarity exists in the relative position of months during the period of the most important 6 months of the year. The Middle Atlantic, East North Central, and Mountain States have a similar pattern during the major 6-month operating period. The period of operation for the West North Central States is different from that of any other area. The greatest variation in operating months is found in the least important 6 months of the year, with only three regions—New England, East South Central, and Pacific Coast—having a similar pattern.

NUMBER AND SIZE OF HATCHERY FLOCKS

In order to determine the extent to which hatcherymen are breeders, data were obtained regarding the number of hatcherymen who owned flocks. Table 8 shows the percentage of hatcheries in each region which owned flocks and the average number of hens in these flocks. Replies were received from 5,903 hatcherymen and of these 3,668, or 62.1 percent, reported they owned a flock from which hatching eggs were obtained. It was found that a greater percentage of the hatcheries in the New England, Middle Atlantic, and Pacific regions owned flocks than in the other regions. It is in these three regions that poultry production is a very specialized industry. It was found that 38.3 percent of the hatcheries in the West North Central region owned flocks. Although poultry production in this area generally is a sideline farm enterprise, it constitutes a very large proportion of the total volume of poultry and eggs produced in the United States. Furthermore, chick prices in this area are almost the lowest in the country.

When compared to the average-size flock of chickens on farms as reported by the Bureau of the Census, the hatchery-owned flocks as shown in table 8 seem quite large, ranging from approximately 400 hens in the East South Central States to over 1,600 hens in New England. The three chief areas of commercial production mentioned above have the largest-sized flocks owned by hatcherymen.

TABLE 8.—*Percentage of hatcheries owning flocks, and average number of hens per flock, 1937-38, by regions*¹

Region	Percent of hatcheries which own flocks	Average number of hens per flock	Region	Percent of hatcheries which own flocks	Average number of hens per flock
New England.....	94.2	1,613	West South Central.....	51.5	480
Middle Atlantic.....	88.3	1,108	Mountain.....	63.6	594
East North Central.....	52.6	691	Pacific.....	77.9	1,298
West North Central.....	38.3	556			
South Atlantic.....	64.2	719			
East South Central.....	64.1	427	UNITED STATES.....	62.1	935

¹ Based on replies from 5,903 hatcheries.

When the data are tabulated by hatchery size-groups as in table 9 it is found that a greater percentage of hatcheries with less than 10,000-egg capacity own their own breeding flocks, and that as the size increases the percentage of hatcheries owning their own flocks decreases. However, the percentage increases again among those hatcheries with more than 200,000-egg capacity.

This same information was obtained in the 1934 survey⁷ and it was found that 54.3 percent of the hatcheries replying owned flocks, compared to 62.1 percent in 1937-38. This represents an increase of 14.4 percent in 4 years. More important, however, is the fact that this increase occurred principally among the larger-sized hatcheries which produce a majority of the chicks hatched commercially in the United States. In view of the widespread adoption of flock-improvement programs among hatcherymen, there has probably occurred an improvement in the general quality of farm and commercial flocks.

TABLE 9.—*Percentage of hatcheries owning flocks, and average number of hens per flock, 1937-38, by size-groups*¹

Size-group (1,000 eggs)	Percent of hatcheries which own flocks	Average number of hens per flock	Size-group (1,000 eggs)	Percent of hatcheries which own flocks	Average number of hens per flock
Under 5.0.....	87.2	346	100.0-199.9.....	37.5	2,170
5.0-9.9.....	83.8	628	200.0-499.9.....	49.5	3,370
10.0-24.9.....	68.2	950	500.0 and over.....	69.6	7,350
25.0-39.9.....	45.0	1,081			
40.0-59.9.....	41.1	1,299			
60.0-99.9.....	39.6	1,558	All size-groups.....	62.1	935

¹ Based on replies from 5,903 hatcheries.

Of the 3,668 hatcheries that reported owning flocks, 1,778 or 30.2 percent reported that these flocks were their only source of hatching eggs. Strictly speaking, these hatchery owners can be termed breeder-hatcherymen in the true sense of the word, although it is realized that many outstanding poultry breeders buy a portion of their hatching-egg supply from outside sources. Regional distribution of these breeder-hatcheries is shown in table 10, and again it can be seen that the New England, Middle Atlantic, and Pacific regions lead in the percentage of all hatcheries that can be classed as breeder-hatcheries. as would be expected, the greatest proportion of breeder-hatcheries is in the smaller-sized groups.

⁷ Op. cit., see table 18, p. 31.

TABLE 10.—Percentage of reporting hatcheries classed as breeder-hatcheries, 1937-38, by regions ¹

Region	Percent	Region	Percent
New England.....	70.3	West South Central.....	14.8
Middle Atlantic.....	58.4	Mountain.....	25.9
East North Central.....	17.1	Pacific.....	46.6
West North Central.....	11.0	UNITED STATES.....	30.2
South Atlantic.....	28.4		
East South Central.....	19.8		

¹Based on replies from 5,903 hatcheries.

Hatcherymen were also requested to report the number of flocks not owned by them from which hatching eggs were obtained, as well as the total number of hens in these flocks. Table 11 shows, by regions, the percentage of hatcheries buying hatching eggs, the average number of flocks supplying hatching eggs to each hatchery, as well as the average number of hens in these flocks. It is interesting to note the high percentage of hatcheries in the East North Central, West North Central, and West South Central regions which buy eggs from other flocks. As shown in table 11, these are the regions, with one exception, having the lowest percentage of hatcheries owning their own flocks. For the United States as a whole, 69.8 percent of all hatcheries obtained at least a portion of their hatching-egg supply from other flocks.

TABLE 11.—Percentage of hatcheries buying hatching eggs, average number of flocks per hatchery, and average number of hens per flock, 1937-38, by regions ¹

Region	Percent of hatcheries buying eggs	Average number of flocks per hatchery	Average number of hens per flock
New England.....	29.7	6.6	883
Middle Atlantic.....	41.6	11.4	330
East North Central.....	82.9	32.6	180
West North Central.....	89.0	34.5	183
South Atlantic.....	71.6	18.6	213
East South Central.....	80.2	43.2	114
West South Central.....	85.2	22.9	149
Mountain.....	74.1	27.4	151
Pacific.....	53.4	10.0	508
UNITED STATES.....	69.8	27.4	194

¹ Based on replies from 5,894 hatcheries.

Although there is considerable variation between regions in the average number of flocks per hatchery, this is largely accounted for by the variation existing in the average number of hens per flock. As table 11 shows, there was found to be a United States average of only 194 hens per flock not owned by hatcherymen, compared to 935 hens in flocks owned by hatcherymen. The average flock producing hatching eggs is apparently only a sideline or incidental source of income for the owner. This is not so true of flocks in the New England and the Pacific regions, however, since they contained an average of 883 and 508 hens, respectively.

When the foregoing data are tabulated on the basis of hatchery size-groups, as in table 12, a sharp increase is found in the percentage of hatcheries buying hatching eggs as the hatcheries increase in size.

Almost all hatcheries with more than 60,000-egg capacity buy at least a portion of their egg supply from other flock owners. There is also a steady increase in the average number of flocks supplying eggs to each hatchery, ranging from only 3 flocks for those hatcheries with capacities of less than 5,000 eggs to 382.9 flocks for those with over 500,000-egg capacity. There does not appear to be any consistent trend in the average size of these flocks.

TABLE 12.—Percentage of hatcheries buying hatching eggs, average number of flocks per hatchery, and average number of hens per flock, 1937-38, by size-groups ¹

Size-group (1,000 eggs)	Percent of hatcheries buying eggs	Average number of flocks per hatchery	Average number of hens per flock
Under 5.0.....	37.5	3.0	249
5.0-9.9.....	42.3	4.1	202
10.0-24.9.....	65.6	9.3	161
25.0-39.9.....	89.6	17.8	163
40.0-59.9.....	92.5	26.1	174
60.0-99.9.....	94.7	41.6	186
100.0-199.9.....	96.6	65.3	201
200.0-499.9.....	99.1	144.8	238
500.0 and over.....	96.0	382.9	233
All size-groups.....	69.8	27.4	194

¹ Based on replies from 5,894 hatcheries.

If it can be assumed that the foregoing data on the number of flocks and the number of hens in these flocks are representative of all the 10,533 hatcheries in operation during 1937-38, it is possible to estimate the total number of hens in the United States that were available for producing hatching eggs. This estimate is shown by hatchery size-groups in column 1 of table 13. It is estimated that 42,531,000 hens were in all flocks owned by hatcherymen, as well as in all other flocks producing hatching eggs for hatcheries. This number of hens is far in excess of the number required if all their eggs were set. Since it is a common practice among hatcherymen, however, to more or less carefully select their hatching eggs, the true minimum number of hens required is not known. It is also necessary for hatcherymen to have available a sufficient number of hatching eggs to meet unusual peak requirements which may occur at any time, or to absorb unusual losses in hatching-egg quality due to such factors as cold weather, etc.

TABLE 13.—Estimated total number of hens producing hatching eggs, and estimated number of hens per 1,000-egg capacity, 1937-38, by size-groups

Size-group (1,000 eggs)	Estimated total number of hens	Estimated number of hens per 1,000-egg capacity	Size-group (1,000 eggs)	Estimated total number of hens	Estimated number of hens per 1,000-egg capacity
	Thousands			Thousands	
Under 5.0.....	856	228	100.0-199.9.....	7,255	104
5.0-9.9.....	1,261	127	200.0-499.9.....	6,262	118
10.0-24.9.....	5,042	105	500 and over.....	3,510	114
25.0-39.9.....	5,234	97			
40.0-59.9.....	6,004	98	All size-groups.....	42,531	107
60.0-99.9.....	7,107	106			

Table 13 also shows the estimated number of hens in both types of flocks for each 1,000-egg incubator capacity. The more or less standard number of hens required to furnish an adequate number of hatching eggs for a hatchery is between 100 and 120 hens for each 1,000-egg

capacity. Thus for a hatchery with a total capacity of 10,000 eggs, it is generally assumed that between 1,000 and 1,200 hens will be required. Table 13 shows that an estimated total of 107 hens was available for the production of hatching eggs for each 1,000-egg incubator capacity. It is probable that this estimate of 107 hens is lower than 15 years ago because of the increased egg production per bird, as well as the increased hatchability of eggs as shown earlier in this report.

CUSTOM HATCHING

In addition to their regular practices, many hatcheries hire their equipment and services, hatching the customer's eggs at a fixed price per egg set. This service of custom hatching, as it is known to the

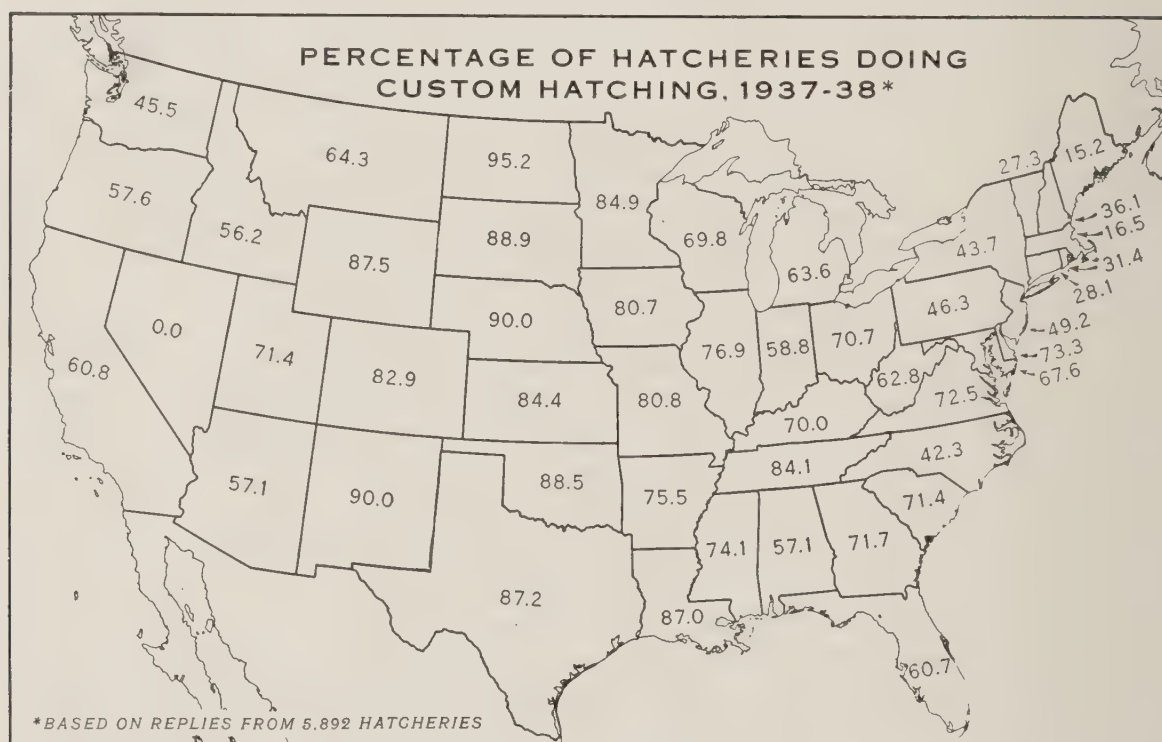


FIGURE 3.—The largest percentage of hatcheries did custom hatching in the Central Western States where there are few breeder-hatcheries, while the smallest percentage did custom hatching in the New England States where breeder-hatcheries predominate.

industry, is simply a matter of shifting the risk to the customer, who receives whatever chicks have hatched out of eggs supplied by him.

The percentage of hatcheries reporting in this survey doing custom hatching ranges from 23.1 percent in the New England region, an area where breeder hatcheries predominate, to well over 80 percent in the West South Central and the West North Central regions where the percentage of breeder-hatcheries is the smallest. A similar comparison is noted in the State percentages as evidenced by the fact that in North Dakota, 95.2 percent of the hatcheries reporting did custom hatching, compared with 15.2 percent in Maine. Of the 5,892 hatcheries in the United States answering this question, 64.6 percent did custom hatching.

The variations between the geographic regions of the United States is much greater than between the size-groups of hatcheries. Custom hatching, as a practice, was more prevalent among hatcheries in the large size-groups than in the small size-groups.

TABLE 14.—Percentage of hatcheries doing custom hatching, 1937-38, by regions and size-groups ¹

Size-group (1,000 eggs)	Region									United States total
	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
Under 5.0-----	20.0	38.0	59.0	64.6	53.5	51.1	63.9	41.7	45.3	46.5
5.0-9.9-----	18.7	40.0	58.3	74.4	59.0	70.0	78.7	57.1	42.5	48.9
10.0-24.9-----	29.7	44.6	71.5	85.2	61.2	79.7	93.4	67.5	52.4	65.0
25.0-39.9-----	27.6	54.0	70.1	84.0	79.7	85.2	88.8	85.7	54.8	73.0
40.0-59.9-----	28.6	64.3	70.1	88.8	61.0	73.3	94.3	85.7	84.1	77.5
60.0-99.9-----	27.3	50.0	72.7	86.7	70.0	73.3	94.9	77.8	69.7	75.7
100.0-199.9-----		55.6	65.4	92.0	96.4	88.9	85.7	66.7	75.9	78.2
200.0-499.9-----	40.0	66.7	76.0	94.1	77.8	100.0	83.3	100.0	63.6	79.8
500.00 and over-----		100.0	100.0	100.0		100.0		100.0	100.0	88.0
All size-groups---	23.1	45.7	68.4	84.0	64.5	72.2	86.3	69.9	56.1	64.6

¹ Based on the replies from 5,892 hatcheries.

HATCHERIES SELLING SEX-SEPARATED CHICKS

Though the art of sex determination of day-old chicks has been practiced for centuries by the Chinese, it is a relatively recent practice on the part of the hatcherymen of this country. Hatcherymen of the Pacific coast were first to adopt this practice commercially in 1933. During the 5-year period, 1933 to 1938, sex-separating of day-old chicks has spread over the United States and is now a part of hatchery routine of approximately one-fourth of the hatcheries.

This survey showed that 1,550 hatcheries, or 26.3 percent of this total, sold sex-separated chicks. The great majority of the larger hatcheries sell sex-separated chicks, while this is true of only a few of the smaller hatcheries. Since skilled persons are required to do the work of sex-separating, it can be expected for a time at least that this practice will be found more generally in the hatcheries with the larger volume of production. Data in table 15 show that only 2.8 percent of the hatcheries with less than 5,000-egg capacity reported selling sex-separated chicks. At the other extreme, 96 percent of the hatcheries with more than 500,000-egg capacity sold sex-separated chicks. Table 15 shows that as hatchery-size increases, a larger percentage of hatcheries reported the practice of selling sex-separated chicks as a part of their business method. There is also considerable variation in different parts of the country in the extent to which the hatcheries in the various size-groups have adopted this practice.

TABLE 15.—Percentage of hatcheries selling some sex-separated chicks, 1937-38, by regions and size-groups ¹

Size-group (1,000 eggs)	Region									United States total
	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
Under 5.0-----	2.9	1.5	3.3	2.4	1.0		1.4		11.0	2.8
5.0-9.9-----	9.6	1.2	13.4	4.8	1.2	3.3	5.0	14.3	38.4	9.4
10.0-24.9-----	18.8	5.1	26.9	14.4	1.5	10.2	9.0	30.0	69.1	20.0
25.0-39.9-----	37.9	8.1	41.4	28.3	4.8	7.7	12.1	28.6	84.5	31.5
40.0-59.9-----	45.5	19.6	56.9	32.0	9.8	6.2	25.0	57.1	79.5	40.0
60.0-99.9-----	45.5	16.8	67.8	40.9	20.7	20.0	32.5	38.9	87.9	48.9
100.0-199.9-----	80.0	55.6	78.8	58.4	32.1	11.1	50.0	100.0	96.6	65.3
200.0-499.9-----	60.0	80.0	89.3	76.5	11.1	50.0	66.7	66.7	100.0	75.0
500.0 and over-----	100.0	100.0	100.0	88.9		100.0	100.0	100.0	100.0	96.0
All size-groups---	15.0	7.7	40.9	27.5	5.6	7.8	13.5	33.8	63.5	26.3

¹ Based on the replies from 5,889 hatcheries.

The sale of sex-separated chicks is a more common hatchery practice in the Pacific Coast States than in any other area of the country. In that area 63.5 percent of the hatcheries reported selling sex-separated chicks. Sexing of chicks is least practiced in the South Atlantic area. Except for the East North Central region, where 40.9 percent of the hatcheries reported selling sex-separated chicks, it appears that in moving eastward from the Pacific Coast States there is in general a gradual decrease in the percentage of hatcheries utilizing this practice. Contacts with hatcherymen indicate, however, that there can be expected an increase in the number of hatcheries adopting this practice, particularly along the Atlantic Seaboard.

The percentage of hatcheries in each State which reported the sale of sex-separated chicks in 1938 is shown in figure 4. In three States,

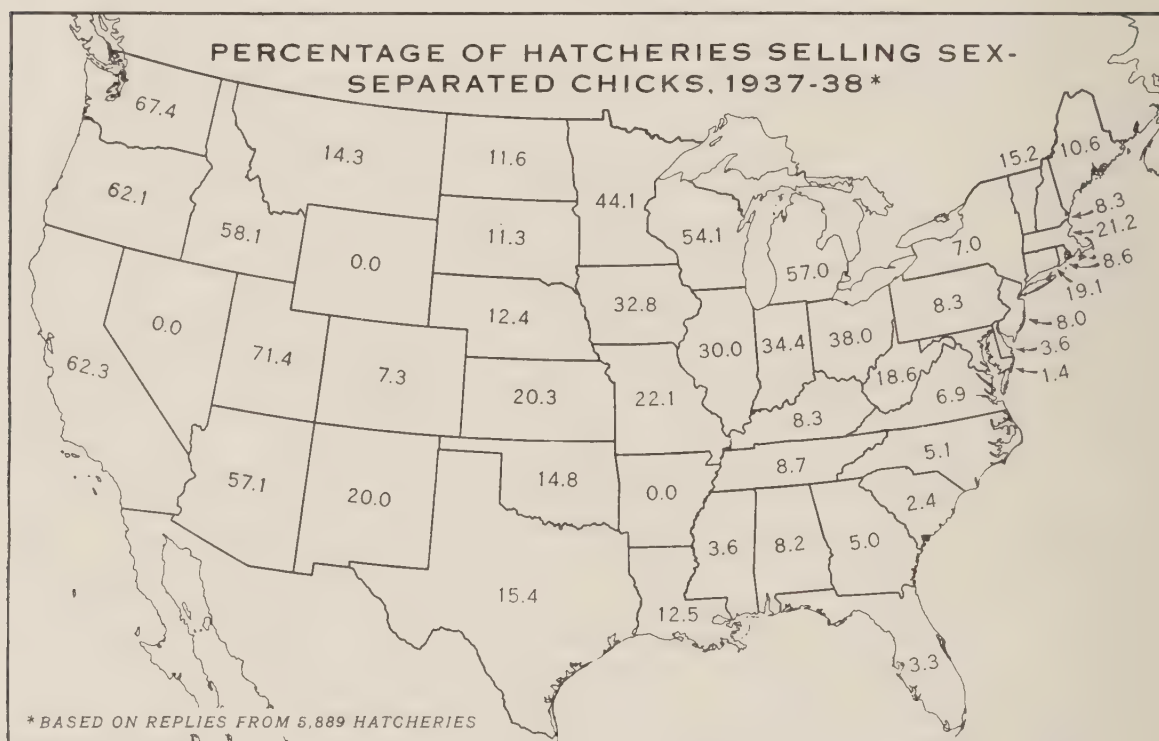


FIGURE 4.—The sale of sex-separated chicks is a general hatchery practice in the Pacific Coast States and is less prevalent in the Eastern States.

Arkansas, Nevada, and Wyoming, no hatchery reported selling sexed chicks. Hatcheries in all of the other States reported selling such chicks, varying from 1.4 percent in Maryland to 71.4 percent in Utah.

DESTROYING COCKEREL CHICKS

Of the 5,824 hatcheries answering the question as to whether or not they destroyed some cockerel chicks there were 403, or 6.9 percent, replying in the affirmative. Based on these replies it is estimated that approximately 7 percent of the hatcheries of the country practice from time to time the destruction of some cockerel chicks.

As hatcheries increase in capacity this practice is more widely used as shown in table 16. It is a rather common practice in the Pacific Coast area, where 30.5 percent of the hatcheries reported destroying cockerel chicks. Hatcheries in the Mountain and East North Central regions also utilize the practice to some extent, but in the rest of the country it is used but very little.

As could naturally be expected, this practice is more common in the areas where sex-separated chicks are sold. Figure 5 shows by States the percentage of hatcheries which destroyed some cockerel chicks. It is to be noted that in 12 States no hatchery reported this

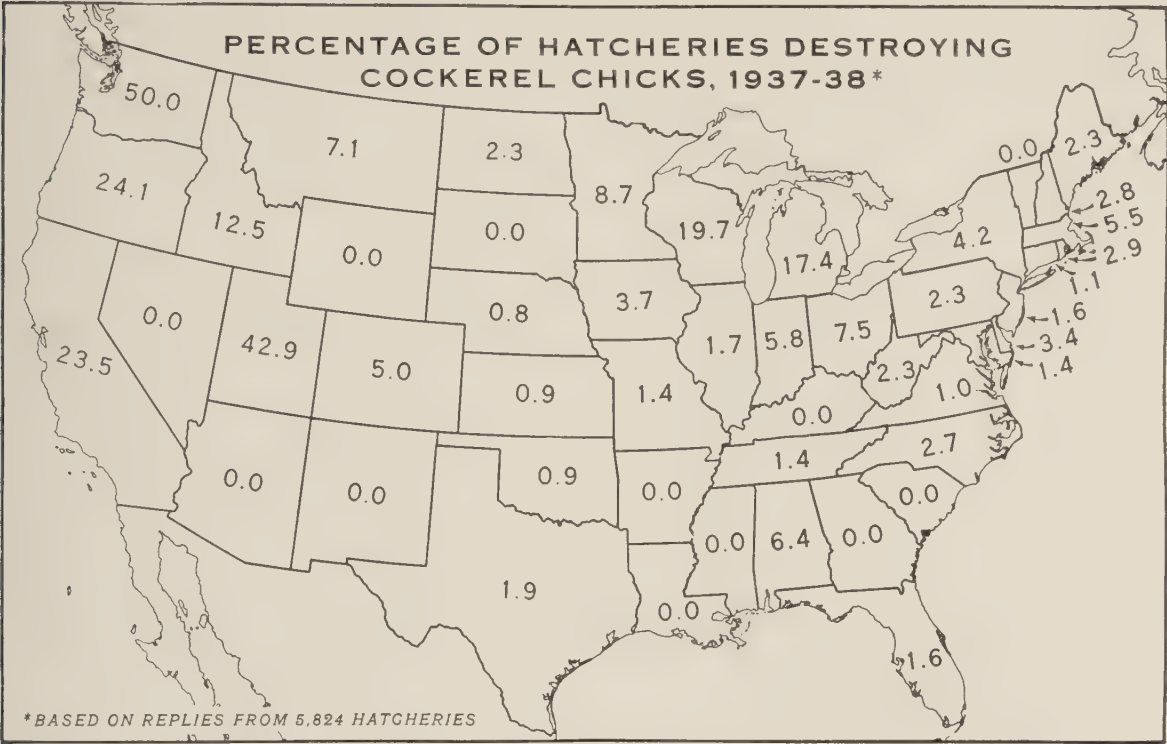


FIGURE 5.—The practice of destroying surplus cockerel chicks is most prevalent on the Pacific Coast and in two Mountain States where White Leghorns predominate. Aside from this area, very few hatcheries destroy cockerel chicks.

practice. Fifty percent of the hatcheries of Washington reported the destruction of some cockerel chicks.

TABLE 16.—Percentage of hatcheries destroying some cockerel chicks, 1937-38, by regions and size-groups ¹

Size-group (1000 eggs)	Region									United States total
	New Eng- land	Middle Atlan- tic	East North Central	West North Central	South Atlan- tic	East South Central	West South Central	Moun- tain	Pacific	
Under 5.0	1.1		0.8	0.8		4.2			9.3	1.5
5.0-9.9	2.4	0.6	2.7				1.7		17.8	2.7
10.0-24.9	4.2	3.7	7.6	2.7	1.5	1.8	.6	7.9	32.7	6.8
25.0-39.9	3.4	1.2	10.4	2.9	4.9		1.0	16.7	35.7	8.0
40.0-59.9	13.8	11.1	10.9	3.1				28.6	34.1	8.7
60.0-99.9		5.3	12.1	4.8	3.4	6.7	5.1	11.1	42.4	10.0
100.0-199.9	20.0		23.1	7.1	3.6		7.1	33.3	50.0	15.7
200.0-499.9		30.0	17.9	11.8			16.7		81.8	20.4
500.0 and over			16.7	11.1				100.0	50.0	20.0
All size-groups	3.1	3.0	9.4	3.4	1.5	2.0	1.4	11.5	30.5	6.9

¹ Based on the replies from 5,824 hatcheries.

STARTED CHICKS

Started chicks are generally assumed to be those that have been given feed and water. Some hatcheries are forced to sell started chicks because they do not have sufficient orders for all the chicks as they are hatched. However, other hatcheries are experiencing a demand for started chicks, because some poultrymen prefer to buy their chicks after the most difficult period of raising them has passed.

This practice is fairly uniform throughout the country, in that more than half of the hatcheries in all regions sell started chicks. For the country as a whole, 69.4 percent sell them. As table 17 shows, fewer hatcheries sell started chicks in the three regions on the Atlantic Coast, as well as the Mountain and Pacific regions, than do hatcheries in the other regions. This is probably due to the fact that commercial egg production is more prevalent on the two coasts than in the central part of the country. Further reference to table

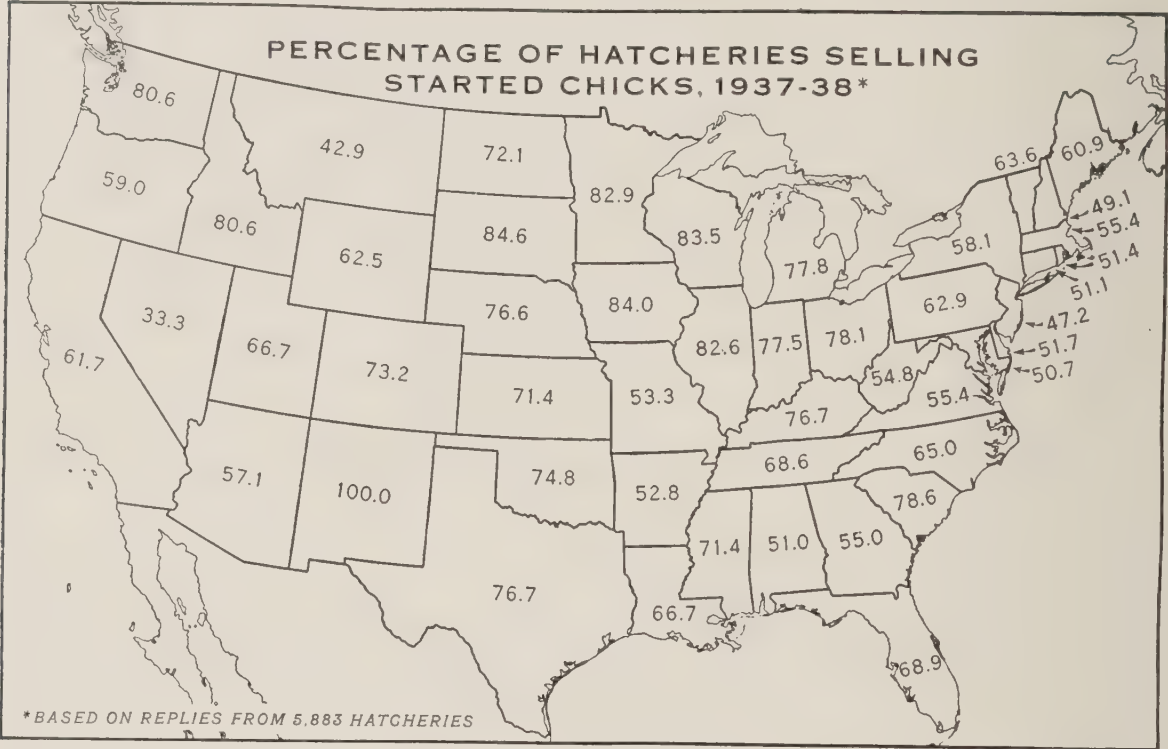


FIGURE 6.—Fewer hatcheries in the Atlantic Coast, Pacific, and Mountain States sell started chicks than do those located in the central part of the United States. This may be partially attributed to the fact that commercial egg production predominates in the extreme eastern and western States.

17 will show that on the basis of capacity groups, there is an increase in the percentage of hatcheries selling started chicks up to those with a capacity of 200,000 eggs, after which a decline occurs.

TABLE 17.—Percentage of hatcheries selling some started chicks, 1937-38, by regions and size-groups ¹

Size-group (1,000 eggs)	Region									United States total
	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
Under 5.0.....	48.9	40.9	48.4	24.2	45.9	58.3	45.8	45.5	50.7	44.0
5.0-9.9.....	61.7	55.0	60.1	45.2	39.3	56.7	62.7	53.6	54.8	55.2
10.0-24.9.....	51.2	57.1	80.1	79.1	62.2	76.3	78.2	65.0	60.4	69.1
25.0-39.9.....	58.6	75.9	88.2	86.5	74.6	77.8	79.4	92.9	75.9	82.2
40.0-59.9.....	68.2	70.2	97.4	83.2	80.5	50.0	82.7	85.7	81.4	84.7
60.0-99.9.....	63.6	73.7	86.7	88.0	69.0	66.7	82.1	77.8	84.8	83.2
100.0-199.9.....	80.0	76.5	82.7	90.3	75.0	88.9	92.9	83.3	86.2	85.2
200.0-499.9.....	60.0	90.0	67.9	76.5	77.8	50.0	83.3	100.0	81.8	75.9
500.0 and over.....	50.0	100.0	66.7	55.6	-----	100.0	100.0	-----	75.0	64.0
All size-groups...	55.1	58.5	79.8	75.5	59.5	67.1	73.3	69.7	66.0	69.4

¹ Based on replies from 5,883 hatcheries.

INTERSTATE ASPECT OF THE HATCHERY SURVEY

Because hatchery capacity is unevenly distributed throughout the country, the buying of hatching eggs and the selling of baby chicks have become important factors in the commercial hatchery industry. If one area or State produces in excess of its needs, there will be an exportation to another area or State. Another factor causing this interstate commerce is the production of breeding stock in certain areas of the country, such as those which have developed and featured heavy dual-purpose breeds of poultry as contrasted with those that produce the light breeds for high egg production. Other areas specialize in cross-bred or hybrid chicks.

As table 18 shows, 22.0 percent of all the hatcheries reporting bought hatching eggs outside their own State. The Mountain Region had the highest percentage, 33.1, of the hatcheries buying hatching eggs outside of the State. It is believed that the reason for this high percentage is the shift that is occurring from the light breeds, with emphasis on egg-laying qualities, to more of the heavy breeds; a change which requires the importation of large quantities of hatching eggs. The South Atlantic, with 30.0 percent, and the East South Central, with 29.3 percent, were the next highest regions. In both of these there has been a scarcity of hatching eggs, and this survey shows an increase of 137.4 percent in the estimated number of chicks produced in the South Atlantic, and 143.5 percent in the East South Central region. The region showing the smallest proportion of hatcheries buying eggs outside their State was New England with 11.9 percent. As would be expected there is a positive relationship between hatchery capacity and the percentage of hatcheries buying eggs outside their State. The range is from 8.4 percent in the smallest size-group to 52.2 percent in the largest size-group.

TABLE 18.—*Percentage of hatcheries buying hatching eggs interstate, 1937-38, by regions*¹

Region	Percent	Region	Percent
New England.....	11.9	West South Central.....	20.4
Middle Atlantic.....	22.1	Mountain.....	33.1
East North Central.....	19.3	Pacific.....	20.5
West North Central.....	25.0		
South Atlantic.....	30.0	UNITED STATES.....	22.0
East South Central.....	29.3		

¹ Based on replies from 5,853 hatcheries.

EXTENT OF INTERSTATE SHIPMENTS

In 1937-38, 36.2 percent of the hatcheries throughout the United States did an interstate business in baby chicks as shown in table 19. This compares with 33.3 percent in 1934. This, however, does not represent an increase in the number of hatcheries doing an interstate business, since the total number of hatcheries has declined by 873 since 1934. More hatcheries in the Mountain region—50.7 percent—sell chicks in interstate commerce than do those in any other region. The East South Central region was the next highest with 46.6 percent. However, it is believed that the reason for the high percentages in these two regions is due to the extensive intra-regional trade that

exists. The New England region showed 42.2 percent of the hatcheries doing an interstate business. Here the high percentage is definitely due to interstate and inter-regional shipments of their breeding stock, as well as hybrid chicks for broiler production. The smallest percentage of hatcheries selling chicks interstate, was in West South Central region, with 26.9 percent.

Table 19 also shows that as hatcheries increase in size, there is a corresponding increase in the percentage that sell chicks in interstate

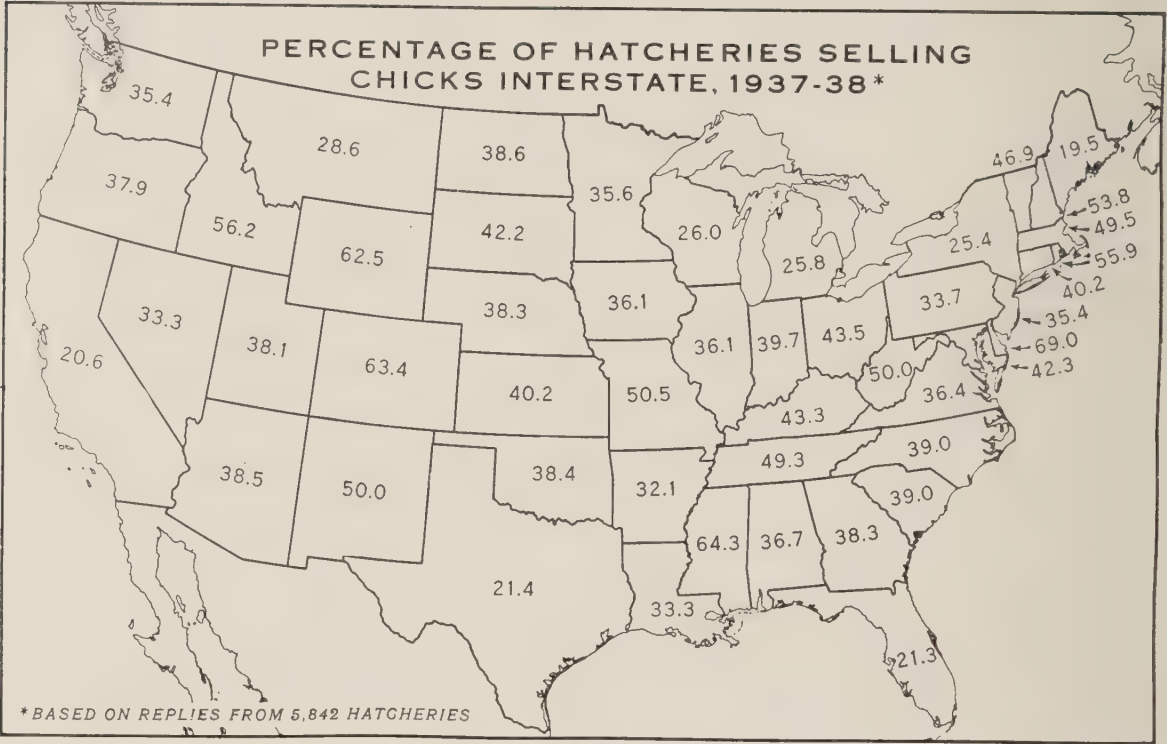


FIGURE 7.—Selling chicks interstate is widespread, and is particularly prevalent among the larger hatcheries.

commerce. The percentages range from 15.6 for the hatcheries in the smallest size-group to 100.0 for the hatcheries in the largest size-group.

TABLE 19.—Percentage of hatcheries selling chicks interstate, 1937-38, by regions and size-groups ¹

Size-group (1,000 eggs)	Region									United States total
	New Eng- land	Middle Atlan- tic	East North Central	West North Central	South Atlan- tic	East South Central	West South Central	Moun- tain	Pacific	
Under 5.0.....	19.4	13.3	10.7	14.8	17.2	29.8	12.7	25.0	10.8	15.6
5.0-9.9.....	36.4	16.4	18.0	16.9	16.9	34.5	12.1	28.6	13.7	21.2
10.0-24.9.....	54.0	27.5	23.5	26.2	32.3	42.4	19.6	43.6	16.9	28.5
25.0-39.9.....	79.3	41.2	31.7	31.1	51.6	55.6	32.0	71.4	34.1	37.0
40.0-59.9.....	81.8	61.4	39.6	48.9	65.0	62.5	34.6	57.1	36.4	47.9
60.0-99.9.....	80.0	68.4	57.0	55.8	82.1	66.7	52.5	83.3	51.6	59.9
100.0-199.9.....	100.0	77.8	78.4	79.3	96.3	100.0	78.6	50.0	82.8	80.9
200.0-499.9.....	100.0	100.0	96.4	87.9	100.0	100.0	83.3	100.0	100.0	94.4
500.0 and over.....	100.0	100.0	100.0	100.0	-----	100.0	100.0	100.0	100.0	100.0
All size-groups...	42.2	30.7	35.7	39.7	39.5	46.6	26.9	50.7	28.3	36.2

¹ Based on replies from 5,842 hatcheries.

HATCHERYMEN AS DEALERS

This survey showed that certain hatcherymen, in addition to their regular operations as hatcherymen, are dealers, agents, or salesmen for other hatcheries in buying and selling hatching eggs or baby chicks. This practice has been developed in an effort to stabilize their business through selling, or exchanging these products with other sources of supply. Table 20 shows that for the country as a whole, 9.5 percent of the hatcherymen stated that they acted as dealers for other hatcheries. Variations in the percentages are found among the different size-groups ranging from 4.2 in the case of the largest hatcheries (500,000 and over) to 12.2 of the hatcheries in the 60,000 to 99,000 group.

There also appears to be considerable variation between regions in the percentage of hatcheries which serve as dealers. The regions with the smallest percentages of dealer-hatcherymen are New England with 2.5, Middle Atlantic with 3.3, and Pacific with 4.3 percent. The South Atlantic, with 7.1 percent, and the West South Central, with 9.8 percent, are next in grouping. Four other regions fall in the higher percentage group and all have nearly the same percentage of dealer-hatcherymen: East North Central, 13.2; East South Central, 13.2; Mountain, 13.4; and West North Central, 14.6.

TABLE 20.—Percentage of hatcherymen acting as dealers in 1937-38, by size-groups ¹

Size-group (1,000 eggs)	Percent	Size-group (1,000 eggs)	Percent
Under 5.0.....	7.5	100.0-199.9.....	6.6
5.0-9.9.....	6.2	200.0-499.9.....	11.5
10.0-24.9.....	10.9	500.0 and over.....	4.2
25.0-39.9.....	10.6		
40.0-59.9.....	10.9	All size-groups.....	9.5
60.0-99.9.....	12.2		

¹ Based on the replies from 5,802 hatcherymen.

HATCHERIES KEEPING COST RECORDS

The percentage of hatcheries keeping a record of operating costs was 59.7, for the entire United States and varied from 36.7 in the New England region to 73.8 percent in the Mountain region. As further evidence of this wide variation, 85.7 percent of the hatcheries in Utah kept cost records, while in Vermont only 21.9 percent kept such records. As table 21 shows the percentage of hatcheries keeping records generally increases as the size of the hatcheries increase.

TABLE 21.—Percentage of hatcheries keeping cost records for 1937-38, by size-groups ¹

Size-group (1,000 eggs)	Percent	Size-group (1,000 eggs)	Percent
Under 5.0.....	40.1	100.0-199.9.....	89.4
5.0-9.9.....	43.7	200.0-499.9.....	95.4
10.0-24.9.....	51.9	500.0 and over.....	84.0
25.0-39.9.....	67.7		
40.0-59.9.....	74.6	All size-groups.....	59.7
60.0-99.9.....	82.3		

¹ Based on the replies from 5,698 hatcherymen.



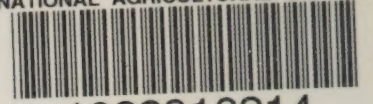
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